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Research Paper

The Role of Trialability in Driving Metaverse Financial Inclusion: Investigating Metaverse FinTech Adoption as a Catalyst for Change

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Abstract

In the current era of digitalization, metaverse financial inclusion (FI) is therefore an enabler and accelerator of broad-based economic growth and resilience, improved financial health, job creation and development. However, Metaverse FI has not attained significant growth globally. The statistics highlighted that a huge number of people do not have an approach to Metaverse digital technologies which have negative influence on FI. Therefore, the objective of this study is to examine the relationship between trialability, Metaverse FinTech adoption and Metaverse FI in the banking industry. A questionnaire was prepared for data collection and employees of banking industry in Pakistan responded to the survey. It is observed that trialability is a critical component of Metaverse FinTech adoption and Metaverse FI. The promotion of Metaverse FinTech adoption and Metaverse FI is possible by promoting trialability. The combination between trialability and Metaverse FinTech adoption has the key contribution to Metaverse FI in banking industry of Pakistan.

Introduction

The fundamental doctrines of Islam place significant importance on inclusivity and the equitable distribution of resources among individuals of varying socio-economic backgrounds (Mohieldin et al., 2015). Metaverse finance tackles the problem of "financial inclusion" or "access to finance" by focusing on two approaches (Lee et al., 2011). Firstly, it promotes risk-sharing contracts as a viable alternative to conventional debt-based financing. Secondly, it utilizes specific instruments to redistribute wealth within society (Mohieldin et al., 2015). However, the promotion of Metaverse FI is highly challenging in the widespread system of conventional FI. Because conventional FI is more popular having strong roots over the decades.

However, the issues in the growth of Metaverse FI can be addressed with the help of latest technological revolution. The current era is the era of technological revolution that nobody can deny the ponderance, and gravity of the technology (de Sousa Jabbour et al., 2018). Now a days, technology is gaining significant attention in every sphere of life (Moktadir et al., 2018; Paelke, 2014; Scavarda et al., 2019; Scheuermann, Verclas, & Bruegge, 2015). The distinctive feature of recent era is digitalization, which compelled the businessman to opt digital transformation in sense of internal processes, internal capability, governance and as a business model (Dörner & Edelman, 2015). According to Gomber et al. (2018), the process for conversion of technology and innovation in the financial sectors as an emerging technology as a result consumers are in a position to accept and choose suitable and completely appropriate services. Information divulgence is triggered by the current information that plays an imperative role to promote the quality of the financial services (Oliveira et al., 2016). Technology can be categorized in to two types such as sustainable technology and disruptive technology (Christensen & Raynor, 2013). A technology that allows the business to improve gradually its operation within the stipulated time period is called sustainable technology. On the other hand, the disruptive technologies are those technologies that disrupt the market leading to FI. Therefore, Islamia FI can be promoted the financial technology (FinTech).

Therefore, FinTech in Metaverse banking industry can be improved through diffusion of innovation theory (DOI). It aims to explain how, why, and the rate at which a product, service, or process can emerge in the market. According to DOI, innovation should have favorable characteristics which should attract people. Innovation characteristics are always important to achieve valuable diffusion rate (Holleman et al., 2009; Tornatzky & Klein, 1982). DOI recommends the following innovation characteristics; trialability, compatibility, observability, relative advantage, and complexity (Hsbollah & Idris, 2009). These Innovation characteristics has the potential to promote IF which can further lead to Metaverse FI in Pakistan. Consequently, by following the concept of DOI, the current study considered trialability, compatibility, observability, relative advantage, and complexity to promote IF which is rarely addressed by the previous studies. Finally, to promote Metaverse FI, this study attempted to address the

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issues of FinTech in Metaverse banking sector through trialability, compatibility, observability, relative advantage, and complexity. Therefore, the objective of this study is to examine the relationship between trialability, Metaverse FinTech adoption and Metaverse financial inclusion. Finally, the framework of the study is reported in Figure 1.

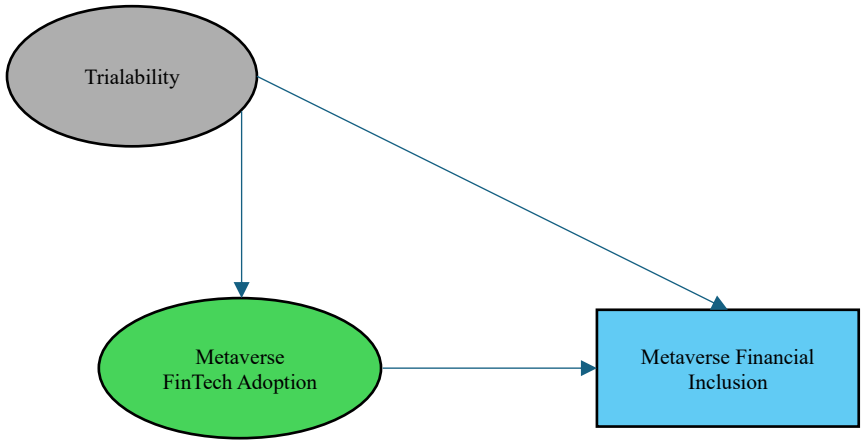

Figure 1: Proposed Conceptual Framework.

Literature Review

In the 1980s, retail financial markets expanded and gave more consumers approach to a wider variety of financial goods. In general, a large number of people, especially those with steady incomes, have benefited from these advances. On the other hand, a small proportion of people lack even the most fundamental financial items, such as insurance or a current account (Kempson & Whyley, 1999). The World Bank defines FI as ensuring that people and organizations may access useful and easily accessible financial products and services, like credit, insurance, deposits, transfers, and purchases, to meet their needs. Trading account accessibility is a first step toward increased FI. In addition to serving as a conduit to other financial institutions (Shafii, Salleh, & Shahwan, 2010), transaction accounts ensure that financial services are accessible to people worldwide. According to the World Bank (2005) when the term "FI" was first coined, it meant providing low-income members of society with affordable financial services.

Trialability is defined by Rogers et al. (2005) as the customer's experience with an invention during a specific time frame. According to earlier research, the trialability of a new idea among customers has a positive impact on the rate of adoption in the future (Ali & Chin-Hong, 2015; Gardner & Amoroso, 2004; Hausman & Stock, 2003; Sanni et al., 2013). Additionally, trailable services reduce the uncertainty surrounding an innovation (Rogers et al., 2005). In the context of the current study, this idea refers to how financial institutions adopt IF for accelerating the Metaverse FI in Pakistan.

Digital revolutions, which have been going on since the middle of the 20th century, are characterized by the merging of hyperphysical systems and technologies, making it harder to distinguish between the digital, physical, biological, and financial domains as well as the economic and financial ones. Terms like "digital finance," (Butler & O'Brien, 2019; Khairov & Khairova, 2019; Ozili, 2018) such as digital payments are important to over the past five years, and they have grown in popularity and importance as conversation topics among consumers, regulators, policymakers, government officials, and experts in the financial sector.

Although Fintech is a relatively new and developing industry, its significance has grown recently. As a result, Fintech has been adopted and embraced by numerous nations, both developed and developing as well as emerging nations, in accordance with their strategies and objectives (Ali et al., 2018; Firmansyah & Ramdani, 2018). However, promoting FI through Fintech is a common objective. Fintech's distinct features—such as its low costs, secure operations, transparency, and other attributes—make it a valuable asset with enormous potential for the Metaverse finance sector. In their most recent report on the Metaverse finance commerce, as IFSB in (2017) made a significant addition by talking about governing concerns, FI, and the compatibility and application of Fintech and shariah to the Metaverse finance industry. According to the report, IF has the potential to expand and flourish quickly in regions where Metaverse banking has gained a systematic and reasonable level of importance.

Pakistan is widely recognised as a least financially inclusive nations globally, mostly because of its exceptionally low degree of FI. A significant portion of the population remains unbanked due to the lack of access to both formal and informal financial services. The lack of access to official financial services is a significant concern in Pakistan, as it affects a substantial proportion (85%) of the population, leading to financial exclusion. A significant segment of the population is unable to obtain financial services due to the exorbitant expenses associated with the banking infrastructure. However, it is quite likely that problems related to the extent and magnitude can be resolved by the implementation of digital financial services. Based on the FinTech Survey 2016 conducted by Karandaaz

Pakistan and FinSurgents in 2017, it was found that 92% of senior executives and 80% of middle managers believe that fintech companies not only facilitate digitization but also have a crucial role in developing markets with limited FI.

FinTech has become a practical solution to address financial exclusion in various developing nations. Latest studies have emphasised the limitations of traditional banks in promoting inclusive finance (Demirgüç-Kunt & Singer, 2017; Senou, Ouattara, & Acclassato Houensou, 2019). However, there is a limited amount of research on the impact of FinTech on FI (Bastian et al., 2018; Lwanga Mayanja & Adong, 2016; Ouma, Odongo, & Were, 2017). Additionally, there is a tendency to overlook the importance of digital savings, which is a crucial aspect of FI (Carmona et al., 2018). Instead, research often focuses on credit, mobile money, and payments (Duvendack et al., 2011).

A significant majority of persons globally, namely 76%, possessed an account with either a bank or a regulated institution. Account ownership increased by 50 percent during the course of ten years, rising from 51 percent of individuals globally in 2011. It is expected that from 2017 to onward, the account ownership rate in developing economies rose by 8 percentage points, increasing from 63 percent to 71 percent of adults. Sub-Saharan Africa's progress has primarily been driven by the use of mobile money. Furthermore, the gender gap in account ownership in developing nations has recently narrowed from nine percentage points, a long-standing figure, to 6 percentage points. The Global Findex database for the year 2019 showing FI is given in Table 1.

Table 1: FI in Developing Economics.

Variable Name (Population, age 15+ (Million) = 144	Country With		
	South Data	Lower Data	Middle Income
Account (% age 15+)			
All adults, 2017	21.3	69.5	58.3
All adults, 2014	13.0	46.5	43.7
All adults, 2011	10.3	32.3	30.5
Financial institution account (% age 15+)			
All adults, 2019	16.3	65.8	58.5
Opened first account to receive a wage or government payment	4.7	43.4	34.8
Mobile money account (% age 15+)			
All adults, 2017	6.9	4.2	6.6
Account, by individual characteristics (% age 15+)			
Women	13.5	65.8	59.2
Adults in the poorest 40% of households	17.6	67.5	58.4
Adults out of the labor force	14.6	61.3	55.0
Youth (ages 15–24)	18.1	58.0	53.9
Made or received digital payments in the past year (% age 15+)			
All adults, 2017	17.7	27.8	30.8
Women	11.3	26.5	32.3
Adults in the poorest 40% of households	15.1	26.1	30.0
Received a digital payment	8.1	18.7	23.3
Made a digital payment	14.9	24.9	30.4
Received a government payment into an account	..*	10.0	11.9
Received a private sector wage into an account	2.8	5.4	6.6
Sent or received a domestic remittance payment using an account	6.4	9.2	13.8
Made a digital utility payment	7.1	10.7	12.3
Made first digital utility payment during COVID-19	..*	7.7	7.1
Made a digital merchant payment	1.1	9.7	11.9
Made first digital merchant payment during COVID-19	..*	6.3	6.5
Storing or saving money in the past year (% age 15+)			
Used account to store money for cash management	7.9	29.5	29.1
Saved any money	13.9	22.6	32.5
Saved using an account	2.8	12.3	14.9
Saved using a savings club or a person outside the family	5.9	8.1	10.8
Borrowing in the past year (% age 15+)			
Borrowed any money	30.2	43.8	45.8
Borrowed formally, including using a credit card	3.6	12.1	13.2
Borrowed from a savings club	1.9	2.9	4.1
Borrowed from family or friends	21.9	31.0	32.5
Not very difficult to access emergency money in 30 days (% age 15+)			
Women	23.4	25.0	34.4
Adults in the poorest 40% of households	22.0	17.0	25.8

Source: Global Findex database for the year 2019

There are several consequences for FI in both theory and practice (Siddik et al., 2014; Yaumidin et al., 2017). Additionally, it makes it easier to establish economic channels. FI requires a digital finance strategy (Ferrata, 2019). Regulators must carefully analyse fintech integration into the current financial ecosystem in order to increase their nation's economic and social prosperity. Promoting financial development in developing nations requires closer cooperation between the fintech and banking sectors. Emerging economies should be able to develop their FI activities more successfully by boosting

the usage of fintech. People can obtain suitable and transparent financial services thanks to technology-enabled FI. Financial literacy, faith in technology, and cost competitiveness are a few obstacles that could prevent FI (Lee, Cho, & Shin, 2015).

Financial services including payment systems, savings accounts, and credit facilities, play a fundamental role in fostering development (Bernard, Kevin, & Khin, 2016; Irene, Bunyasi, & Muchiri, 2017; Kumari, Azam, & Khalidah, 2019). Accounts, whether held with a bank, entity like a credit union, microfinance institution, enable individuals to securely and inexpensively store, transfer, and receive funds. To meet daily requirements, prepare for unforeseen circumstances, and make advantageous investments for the future, such as in healthcare, education, and enterprises. Individuals lacking an account, on the other hand, are compelled to handle their finances through informal channels, such as physical currency, which can be less secure, less dependable, and more costly compared to official means.

The proportion of adults engaged in digital payments in developing economies (Widyasthana et al., 2017) increased from 35 percent in 2014 to 57 percent in 2019. Almost all adults in high-income economies (95 percent) engage in digital payments. Receiving a payment directly into an account serves as a means to access and utilise various financial services. It is worth noting that the percentage of adults in developing economies who both received and made digital payments increased from 66 percent in 2014 and 70 percent in 2017 to 83 percent. Approximately 66% of individuals who received digital payments also utilised their account for the purpose of cash management. Around 40% of these individuals utilised their account to save money. Additionally, 40% of payment recipients borrowed money through formal means.

Within emerging economies, 36 percent of people were recipients of a monetary transaction deposited into a designated account. The many forms of incoming payments encompass private or public sector wages, government transfers or pension payments, domestic remittance payments, and payments for the sale of agricultural products. While the majority (83 percent) of individuals made a digital payment, they also made a payment into an account. Recipients of payments have the option to make various types of digital payments (Widyasthana et al., 2017). These include digital merchant payments, which are made by 65 percent of individuals who receive a payment into an account. Additionally, 53 percent of recipients make bill payments using a mobile phone or the internet, while 33 percent make utility payments. Furthermore, 32 percent of recipients make domestic remittances payments from an account. Due to the fact that a significant number of persons who received payment into an account utilised multiple forms of digital payment, the cumulative percentages exceed 83 percent. Figure 2 presented the percentage of adults using an account for financial services in developing economies. Additionally, Figure 2 highlighted the adults who receive payment into an account.

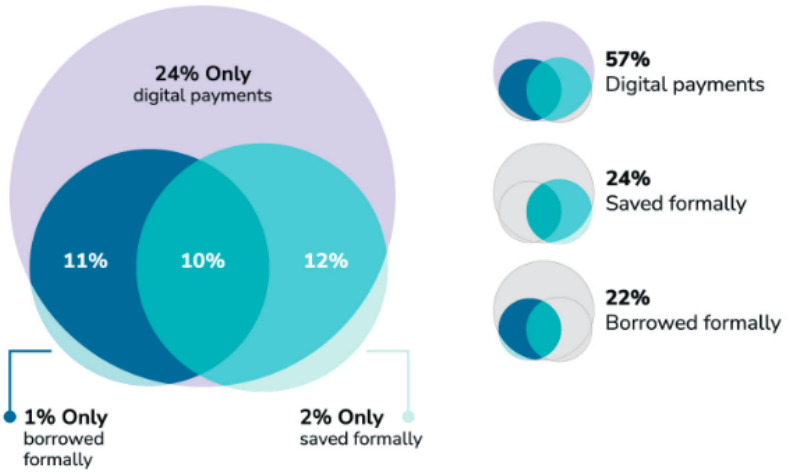

Figure 2: Adults using an account for Financial Services in Developing Economies (%), 2019.
Source: The Global Findex Database 2019

Approximately 66% of individuals who received a payment into their account also utilised the account for the purpose of storing money. Approximately 40 percent of individuals who received payments reported engaging in formal savings, while another 40 percent reported borrowing money formally. Adults who received a payment into an account were more inclined than the general population to engage in digital payments and to engage in financial activities such as storing, saving, or borrowing money. Within developing economies, the proportion of individuals who received digital payments and made digital payments was significantly higher at 83 percent, compared to the overall percentage of all adults making digital payments, which was at 51 percent. Similarly, 63 percent of individuals utilised an account for storing money, in contrast to 39 percent of the entire adult population. Additionally, 42 percent saved money in a formal manner, compared to 25 percent of all adults. Furthermore, 39 percent of individuals borrowed money in a formal manner, compared to 23 percent

of all adults. Finally, the relationship between trialability, Metaverse FinTech adoption and Metaverse financial inclusion is measured by considering following hypotheses:

Hypothesis 1: *Trialability can promote Metaverse FinTech adoption.*

Hypothesis 2: *Trialability can promote Metaverse financial inclusion.*

Hypothesis 3: *Metaverse FinTech adoption can promote Metaverse financial inclusion.*

Hypothesis 4: *Metaverse FinTech adoption mediates the relationship between trialability and Metaverse financial inclusion.*

Methodology

A quantitative research approach is employed to assess the correlation between the proposed hypothesis in the investigation. The social sciences mostly rely on quantitative methods as their dominating research paradigm. It pertains to a collection of methodologies, tactics, and assumptions used while examining numerical patterns to look into psychological, social, and economic phenomena (Levine et al., 2008; Westerman, 2006). Quantitative research collects a variety of numerical data. The data was collected using a cross-sectional research design. The present investigation did not employ a longitudinal research strategy but rather a cross-sectional one because of constraints in both time and resources (Fagerlin et al., 2007; Saunders et al., 2015; Sekaran & Bougie, 2016).

A population refers to the complete set of individuals or objects that one intends to make inferences or conclusions about (Hair, 2007; Saunders et al., 2015; Sekaran & Bougie, 2010; Sekaran & Bougie, 2016). A sample refers to a particular group from which data is collected. The sample size is invariably smaller than the population size. According to Polit Denise and Hungler Bernadette (1999), a population is defined as the complete group of individuals who are of interest to the researcher and who satisfy certain requirements. This entire group can benefit from the research findings. LoBiondo-Wood and Haber (2013) defined a sample as a selected section or subset of the research population that represents the entire research population and is chosen to participate in a study. The banking sector serves as the study's base of population. This study covered all banks operating in Pakistan and gathered information from these institutions' customers. A questionnaire was prepared for data collection and employees of banking industry in Pakistan responded to the survey. For the data analysis, 162 questionnaires were received.

Data Analysis

Missing Value Analysis

When constructing a meaningful statistical inference, it is not acceptable to have any percentage of missing values in a dataset (Hameed, 2019). Nevertheless, scholars reached a consensus that a rate of 5% or lower is deemed statistically insignificant (Tabachnick & Fidell, 2007). Furthermore, it is recommended that if the overall proportion of missing data is 5% or lower, the method of mean substitution should be employed (Raymond, 1986).

This study considered the missing value analysis because missing values can effect the results. SPSS is the most suitable software to fix the issues related to the missing value. Therefore, this study used a mean replacement method to fix the errors related to missing values (Noor et al., 2015). Missing values are reported in Table 2 and Figure 3. A total of 16 missing values were found which were fixed with the help of mean replacement method, a most suitable method to fix the missing values in primary data.

Table 2: Missing Values.

Variables	Missing Values
Metaverse FI	08
Metaverse FinTech Adoption	05
Trialability	3
Total	**16**

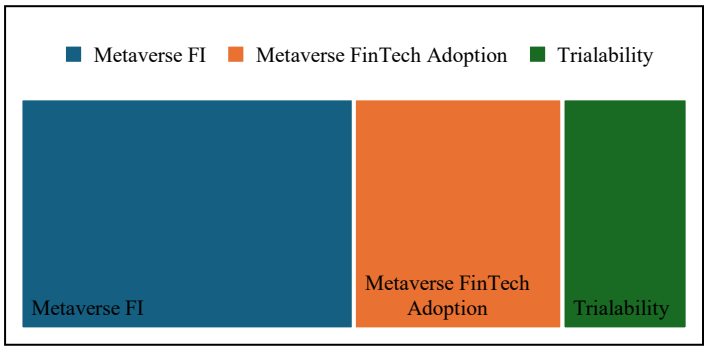

Figure 3: Missing Values.

Treatment of Outlier

An outlier is a data point that deviates significantly from the rest of the values in a random sample taken from a population (Barnett & Lewis, 1994; Yin, Wang, & Yang, 2014). This definition grants the analyst, or a consensus process, the authority to determine what would be deemed abnormal. The presence of outliers in a given dataset can significantly distort the estimation of regression coefficients, resulting in inaccurate outcomes (Verardi & Croux, 2009). The Mahalanobis test is most important to identify the errors related to the outlier

(Todeschini et al., 2013). The preliminary examination of the data using the Mahalanobis approach indicates the absence of any outliers which is performed with the help of SPSS. Thus, none of the outliers were found in the data.

Reliability and Validity Assessment

The measurement model has been verified to provide a reasonable level of reliability and validity. Consequently, the evaluation of the measurement model has been conducted accurately using the PLS-SEM approach and the Smart PLS 3.0 software (Hair et al., 2010; Matthews, 2017). The measurement model was used to consider the factor loadings in which the reliability of scale items was confirmed. Furthermore, reliability of constructs was confirmed along with the convergent validity and discriminant validity. The PLS measurement model was performed which is shown in Figure 3. Figure 4 highlighted the factor loadings which was used to confirm the construct reliability along with the convergent validity. PLS measurement model is also known as outer model. As this model only focused on the outer part of the model which shows the factor loadings. The outer model highlighted the factor loading of each scale item. Additionally, discriminant validity was confined by using HTMT. CR is above 0.7 and AVE is above 0.5 confirmed the convergent validity as shown in Table 3.

Table 3: Loadings, Composite Reliability (CR) and Average Variance Extracted (AVE).

Variables	Items	Loading
Metaverse FI (MFI)	MFI1	0.781
CR = 0.799	MFI2	0.821
AVE = 0.521	MFI3	0.752
Metaverse FinTech Adoption (MFA)	MFA1	0.874
CR = 0.725	MFA2	0.756
AVE = 0.501	MFA3	0.741
Trialability (TRI)	TRI1	0.702
CR = 0.774	TRI2	0.799
AVE = 0.511	TRI3	0.732

Note: Metaverse FI = MFI; Metaverse FinTech Adoption = MFA; Trialability = TRI

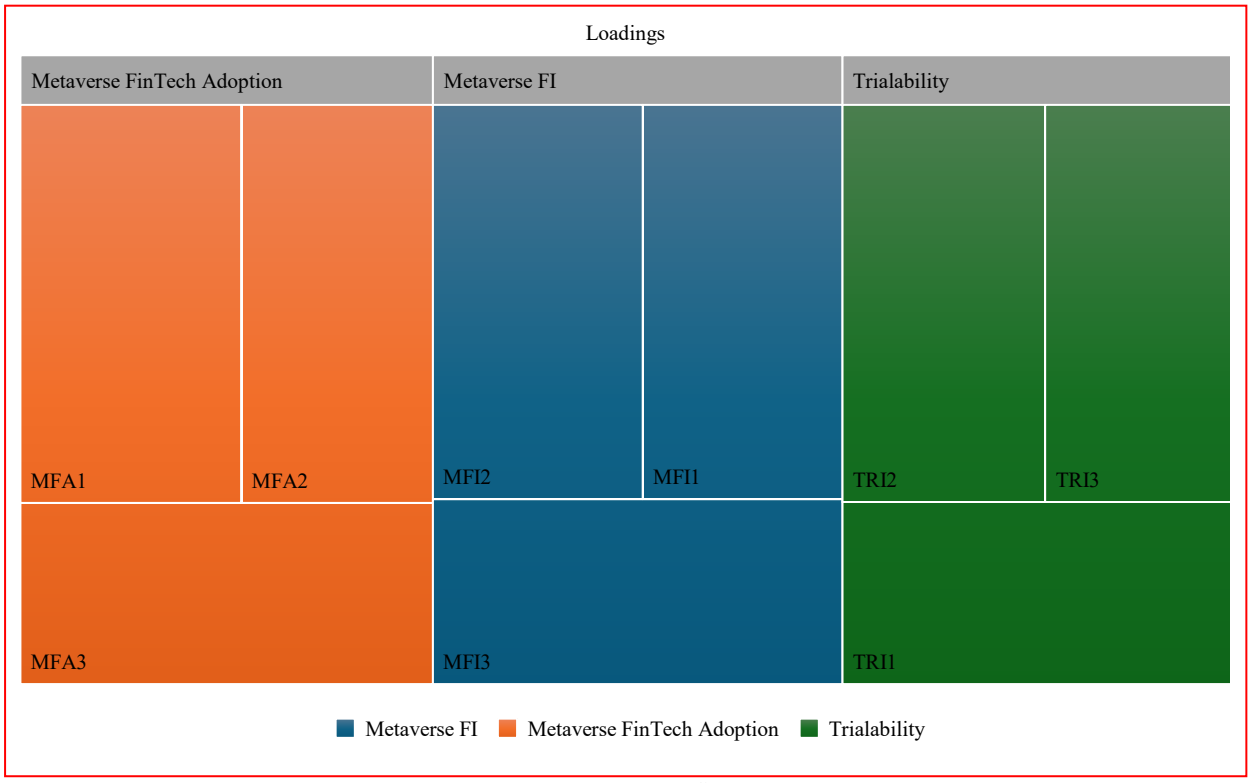

Figure 4: Factor Loadings.

Hypotheses Testing Results

Bootstrapping is a nonparametric method used to assess the statistical significance of different path coefficients in PLS-SEM analysis (Ali & Kim, 2015; Cheah et al., 2018; Kock, 2015; Streukens & Leroi-Werelds, 2016). Bootstrapping was used to test the study hypotheses. Both direct and indirect hypotheses are tested in this part of the data analysis. T-value and beta value was considered to test the relationship between trialability, Metaverse FinTech adoption and Metaverse FI. Four hypotheses are tested as shown in Table 1 and Figure 1. All the hypotheses are supported because t-value is higher than 1.96 and beta value is positive. These results are given in Table 4 and Figure 5.

Table 4: Hypotheses Testing Results.

Hypothesis	Beta-Value	T-Value	Decision
Hypothesis 1	0.259	3.653	Supported
Hypothesis 2	0.189	3.212	Supported
Hypothesis 3	0.421	0.541	Supported
Hypothesis 4	0.325	0.635	Supported

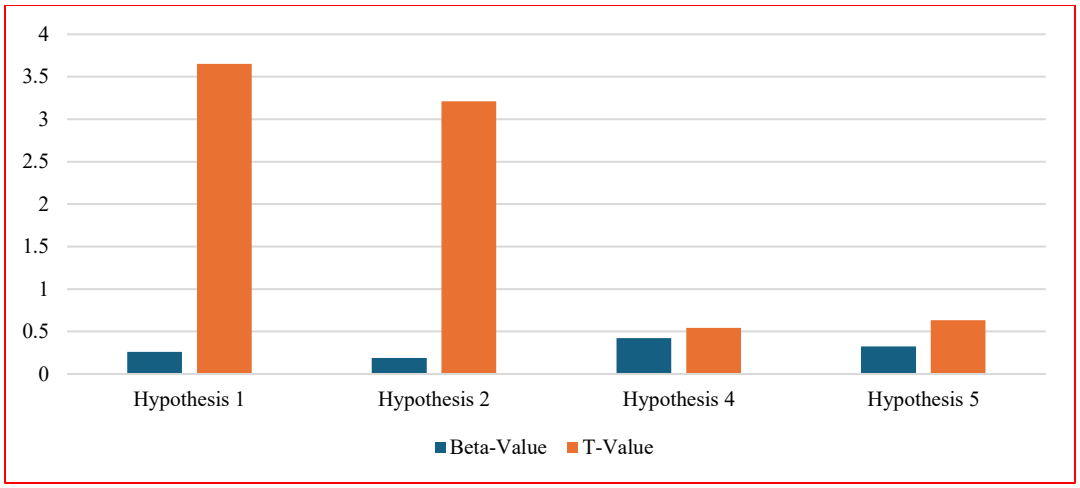

Figure 5: Hypotheses Testing Results.

Discussion and Conclusion

The objective of this study was to examine the relationship between trialability, Metaverse FinTech adoption and Metaverse FI in the banking industry. The relationship between trialability and Metaverse IF adoption was considered. Results of the study proved an insignificant relationship between trialability and IF adoption. Trialability has no direct effect on the IF adoption. It can be further described as the ability to test the intervention cannot influence the rate of IF adoption. Trialability has no direct effect on IF adoption, however, it may have indirect effect through other ways. The possible reason behind this is the unavailability of trialability services for the banking customers.

According to the findings, trialability has positive effect on Metaverse FI. The promotion of trialability in IF can promote Metaverse FI. Few studies addressed the positive effect of trialability in relation to FI and reported the positive relationship between trialability and FI (Agrawal & Jain, 2019), however, these are very limited studies. Therefore, this relationship is quite unique in literature. Organisations that possess the capability of trialability operate in a more sophisticated manner, and their decision-making process relies on the initial trial of products and services. Trialability offers organisations a substantial potential to efficiently expand by conducting first testing when introducing products and services. Innovativeness pertains to an individual's capacity for imaginative thinking and creative problem-solving, which are crucial for achieving success in the future. It is crucial to acknowledge that the capacity to try out or experiment with new ideas is essential for fostering innovation and enhancing the efficiency of corporate operations. Reliability is a key factor for organisations to attain success, as it is determined by the attributes of a certain project. The project in the trialability stage can be altered prior to its introduction to the market (Banerjee, Wei, & Ma, 2012; Changchun, Haider, & Akram, 2017; Hayes et al., 2015). Employees who exhibit innovation resistance are less inclined to embrace trialability due to their aversion to novelty in their work.

Implications of the Study

This study explored new relationships which have valuable importance to fill the literature gap. The new relationships in this study have importance for the academicians because it led to the exploration of new ideas. For instance, this study introduced the effect of trialability on Metaverse IF adoption in Pakistani banking sector. This relationship considered by the current study was not addressed by earlier studies. Similarly, the effect of trialability Metaverse FI was not addressed by earlier studies. These relationships have major significance for the academicians to explore more ideas to promote banking industry through Metaverse FI.

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CRediT Authorship Contribution Statement

Rashid Hayat: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

I confirm that I have no relevant financial or personal interests to disclose.

Funding

I declare that this study was conducted without financial support from external sources.

Ethical Statement

The research complied with ethical guidelines, and approval was not needed since no biological or tissue samples were involved.

Data Availability Statement

The datasets created and examined in this research are accessible from the corresponding author if reasonably requested.

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